JUN 21 2004

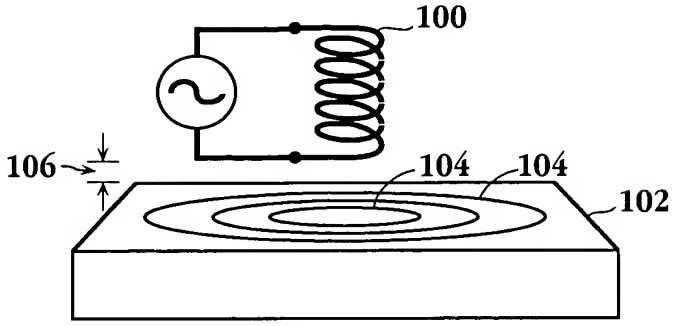

Fig. 1 (prior art)

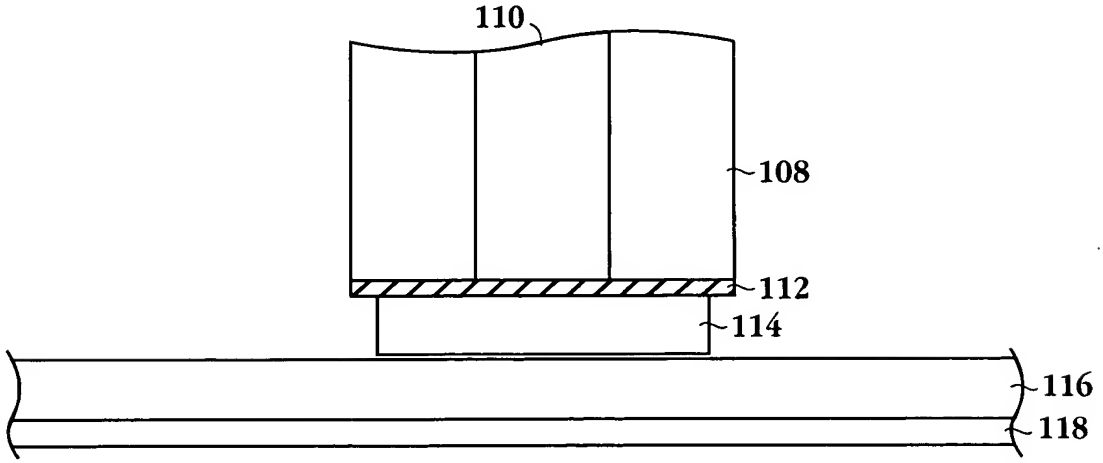

Fig. 2 (prior art)

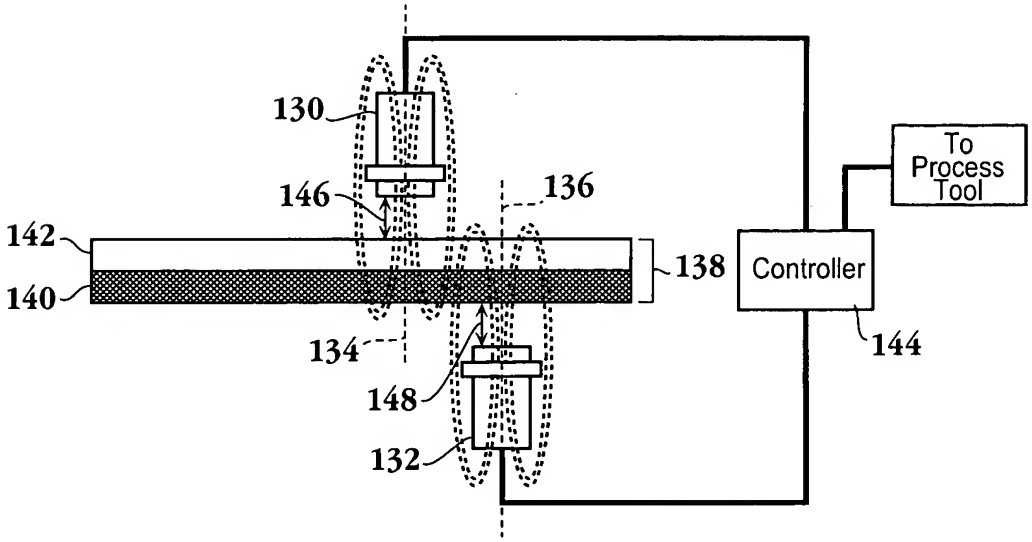
130
146
136
142
140
138
Controller
To Process Tool
144
134
148
132

Fig. 3

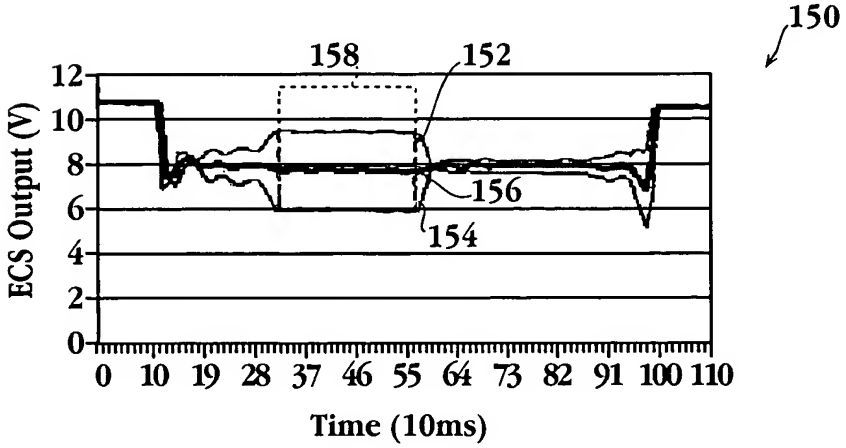
150
158
152
156
154
ECS Output (V)
12
10
8
6
4
2
0
0 10 19 28 37 46 55 64 73 82 91 100 110
Time (10ms)

Fig. 4

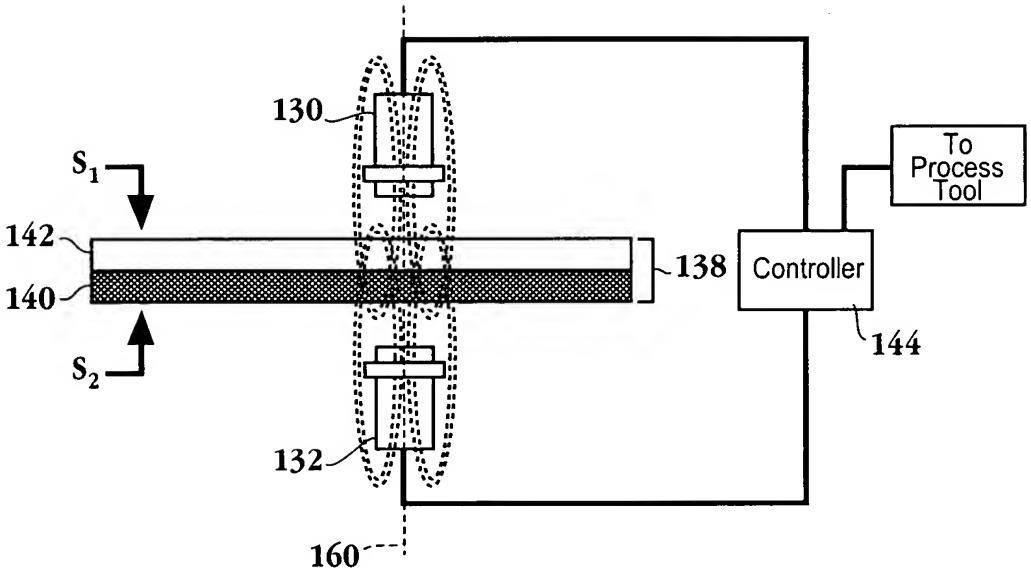

Fig. 5

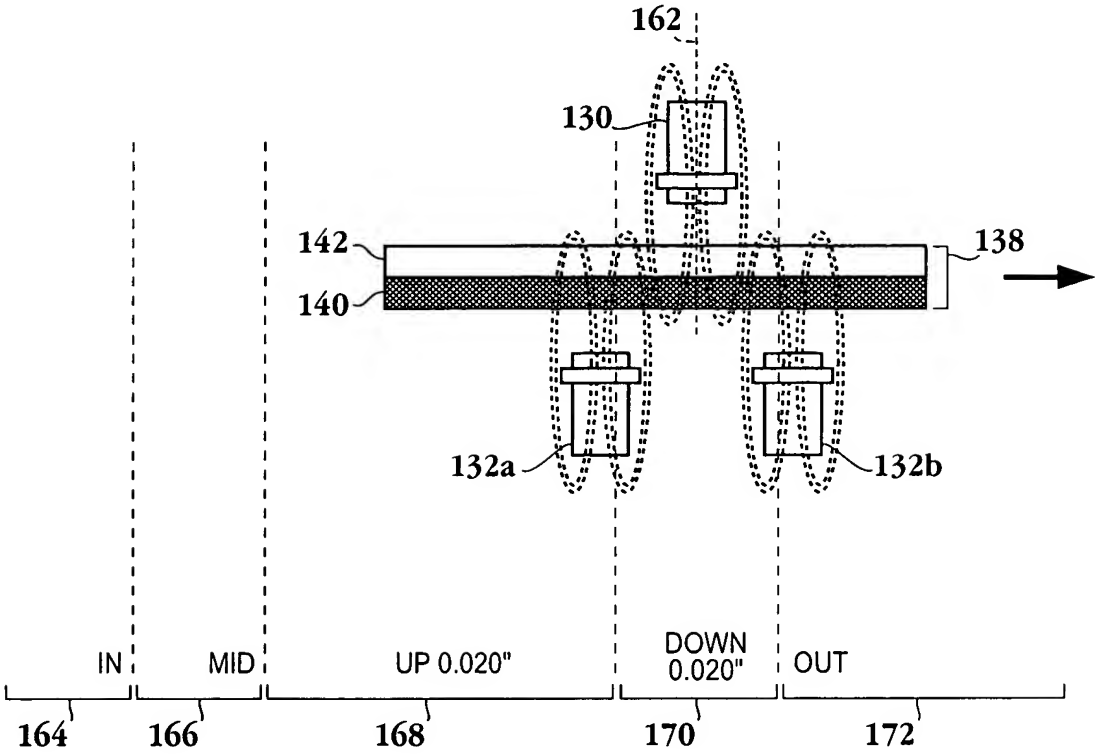
162
130
142
140
138
132a
132b
IN
MID
UP 0.020"
DOWN 0.020"
OUT
164
166
168
170
172

Fig. 6A

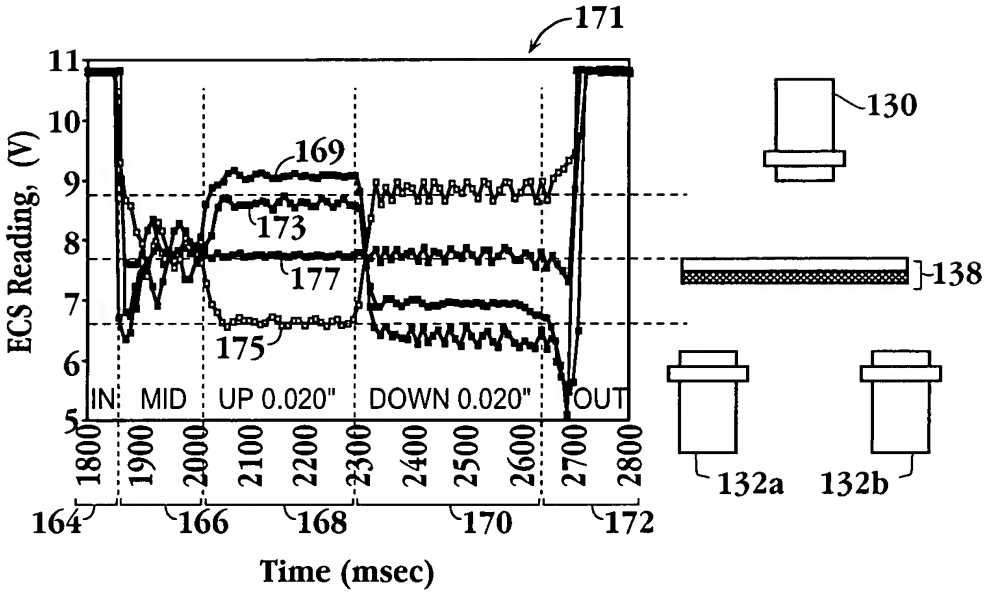
171
11
10
9
8
7
6
5
ECS Reading, (V)
169
173
177
175
IN
MID
UP 0.020"
DOWN 0.020"
OUT
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
164
166
168
170
172
Time (msec)
130
138
132a
132b

Fig. 6B

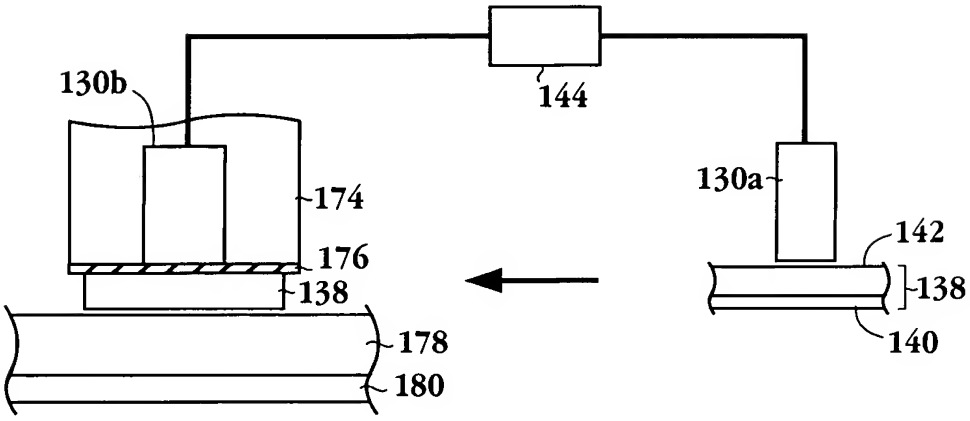
130b
144
130a
174
142
176
138
138
178
140
180

Fig. 7A

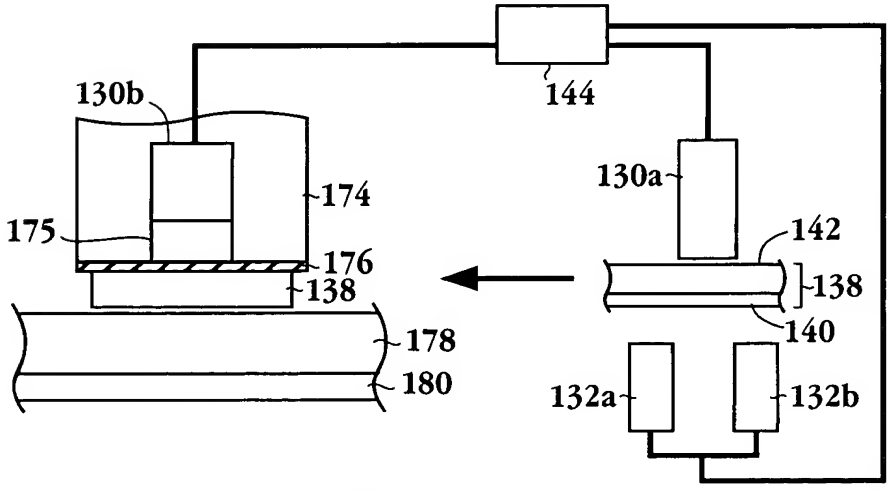
130b
144
130a
174
175
142
176
138
138
178
140
180
132a
132b

Fig. 7B

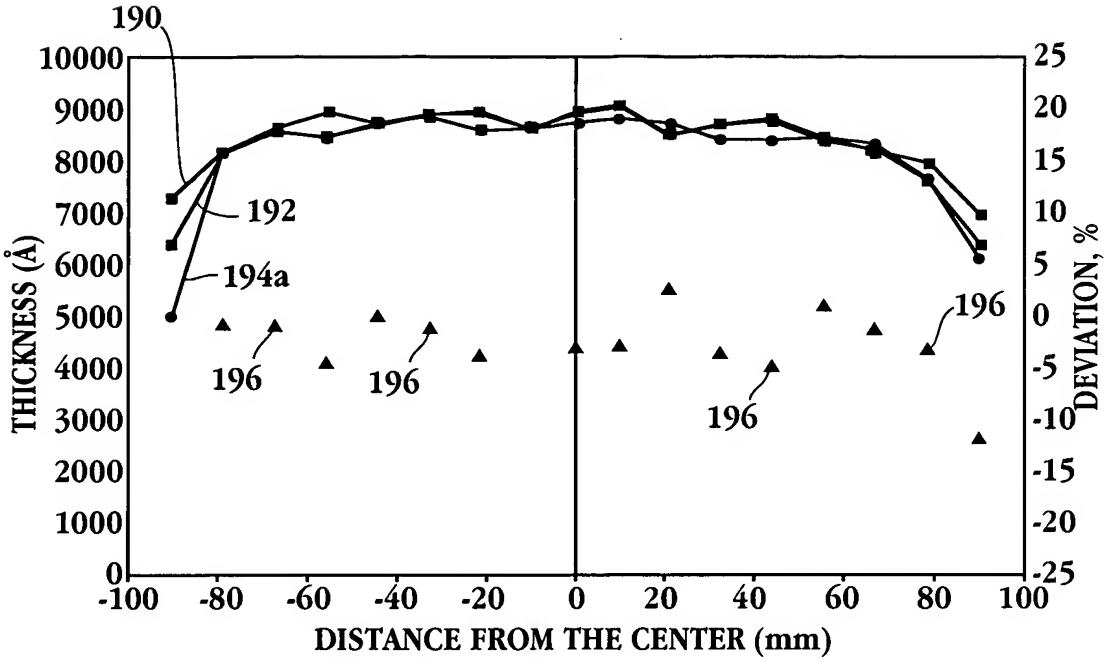
190
192
194a
196
196
196
196
THICKNESS (Å)
DEVIATION, %
DISTANCE FROM THE CENTER (mm)

Fig. 8A

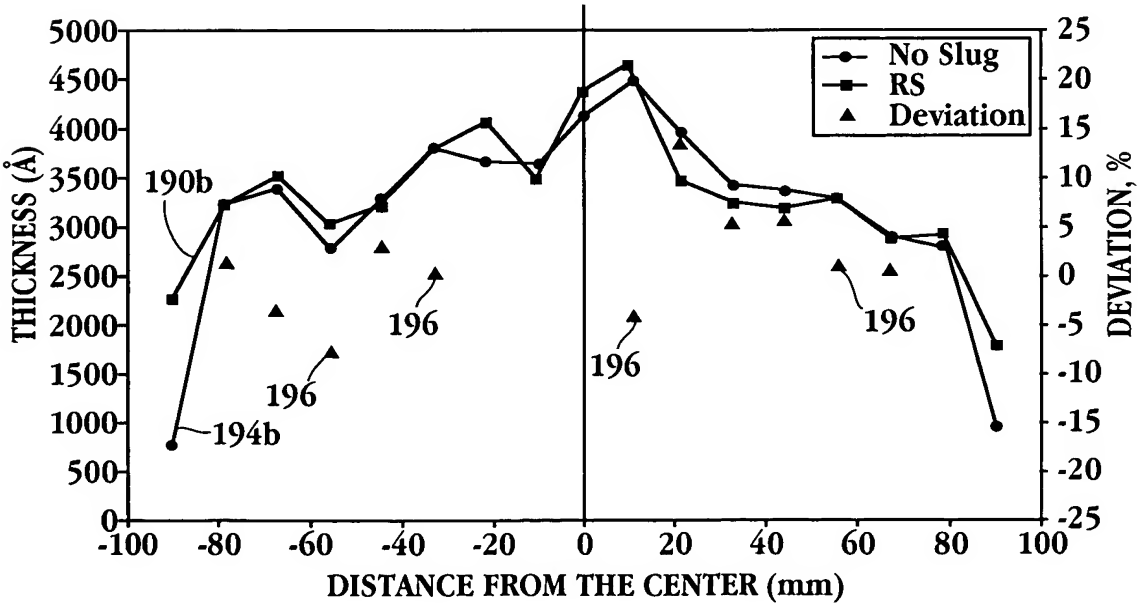
No Slug
RS
Deviation
190b
194b
196
196
196
196
THICKNESS (Å)
DEVIATION, %
DISTANCE FROM THE CENTER (mm)

Fig. 8B

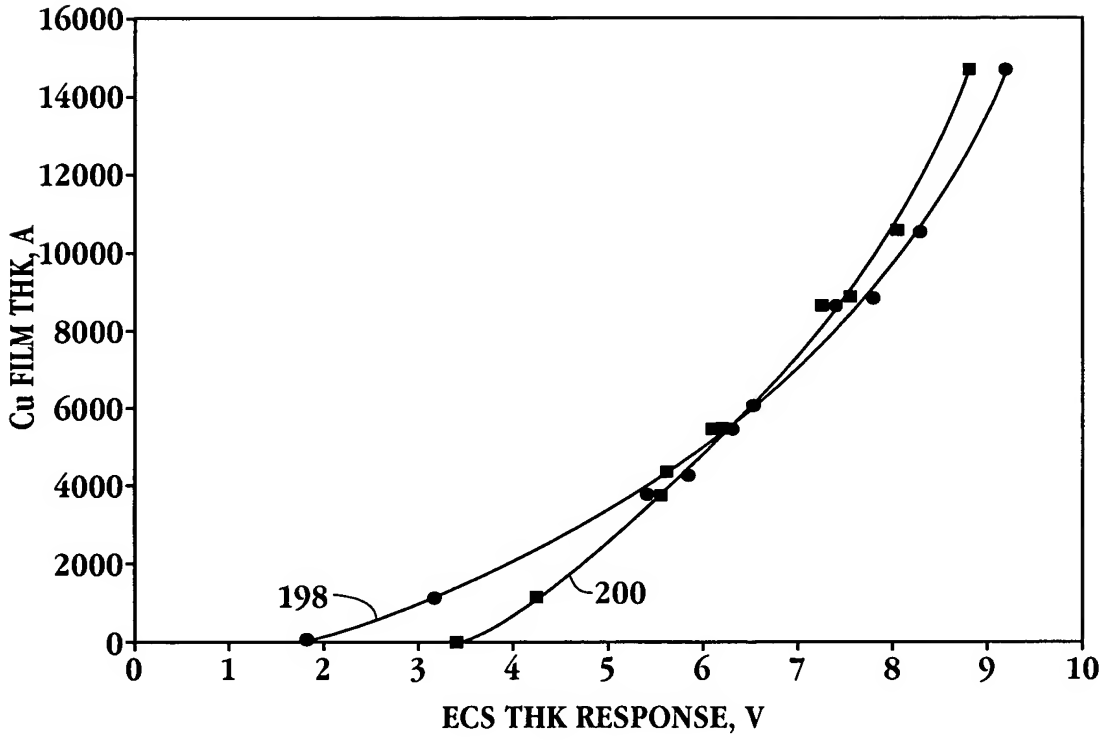
16000
14000
12000
10000
8000
6000
4000
2000
0
Cu FILM THK, A
0
1
2
3
4
5
6
7
8
9
10
ECS THK RESPONSE, V
198
200

Fig. 9

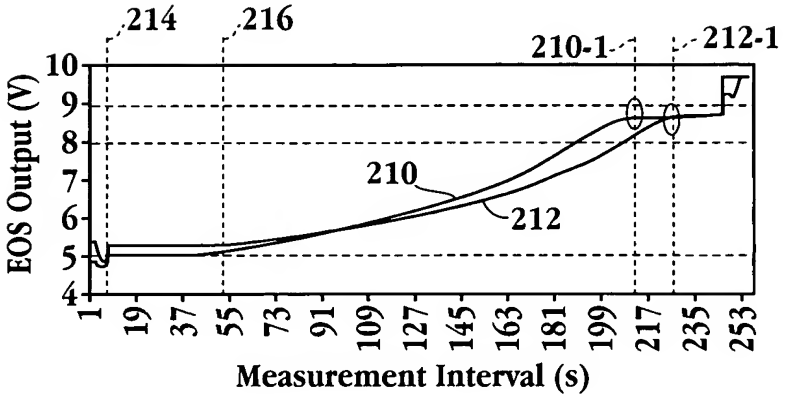

Fig. 10

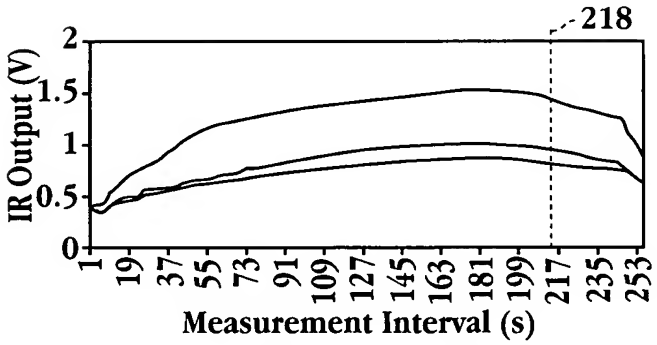

Fig. 11A

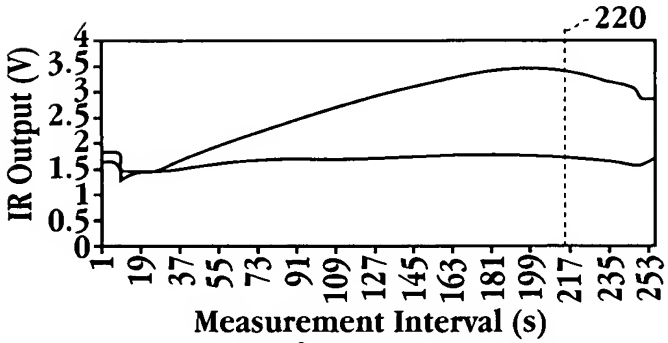

Fig. 11B

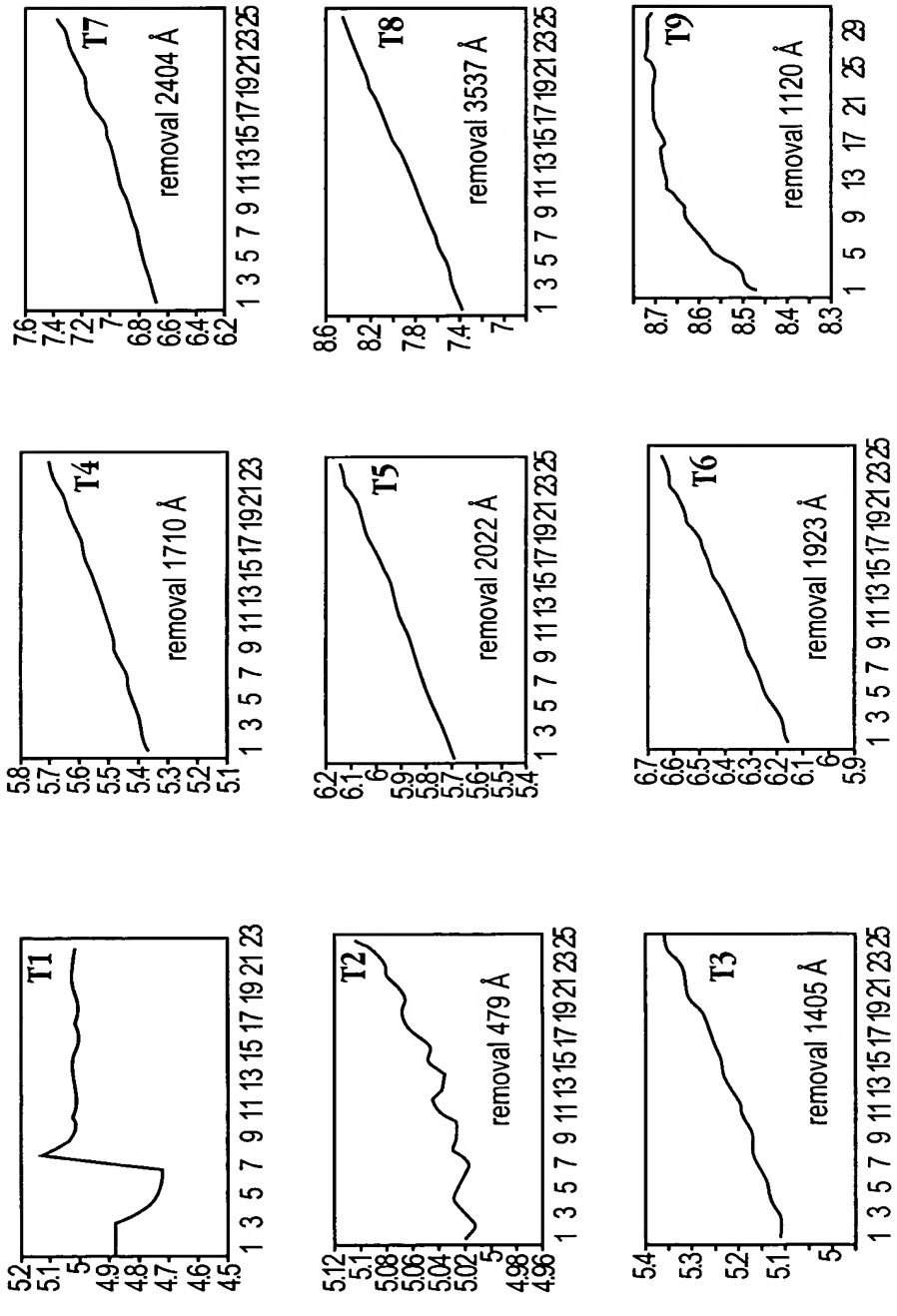
T1
T2
T3
T4
T5
T6
T7
T8
T9
removal 479 Å
removal 1405 Å
removal 1710 Å
removal 2022 Å
removal 1923 Å
removal 2404 Å
removal 3537 Å
removal 1120 Å

Fig. 12

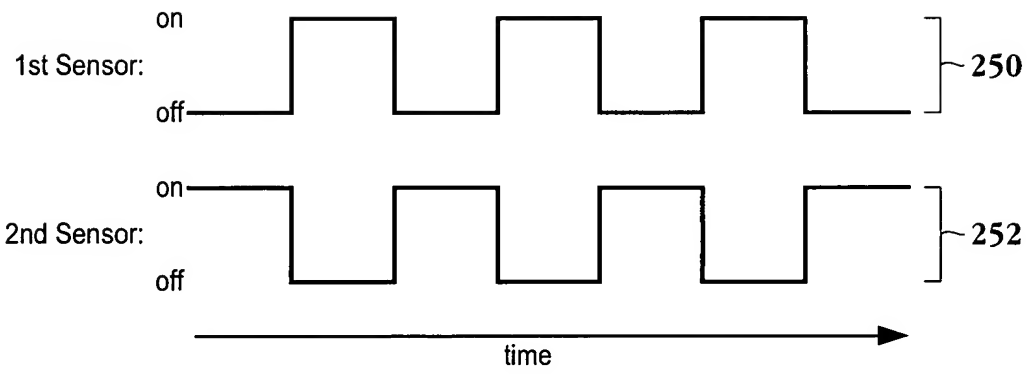

Fig. 13

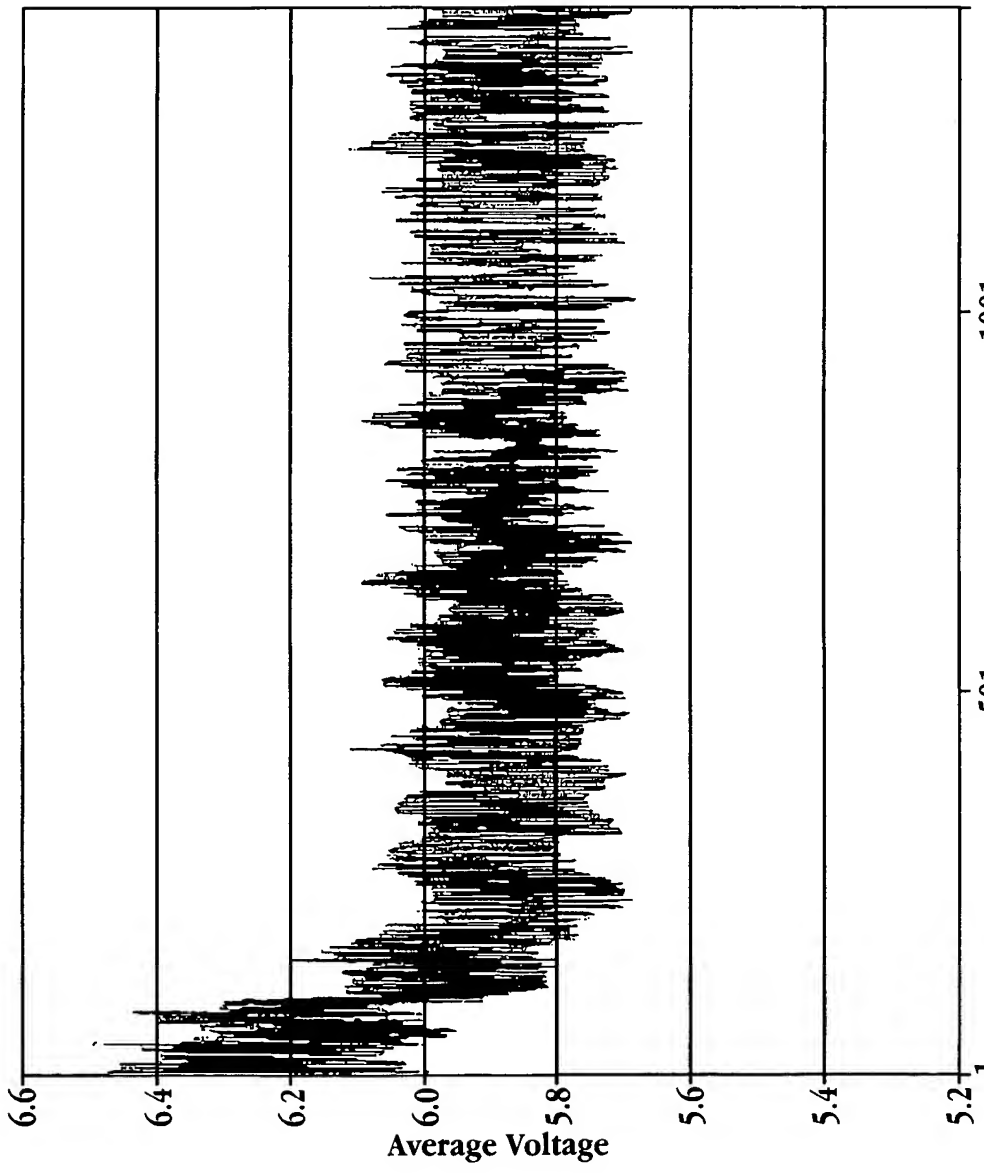

Fig. 14A

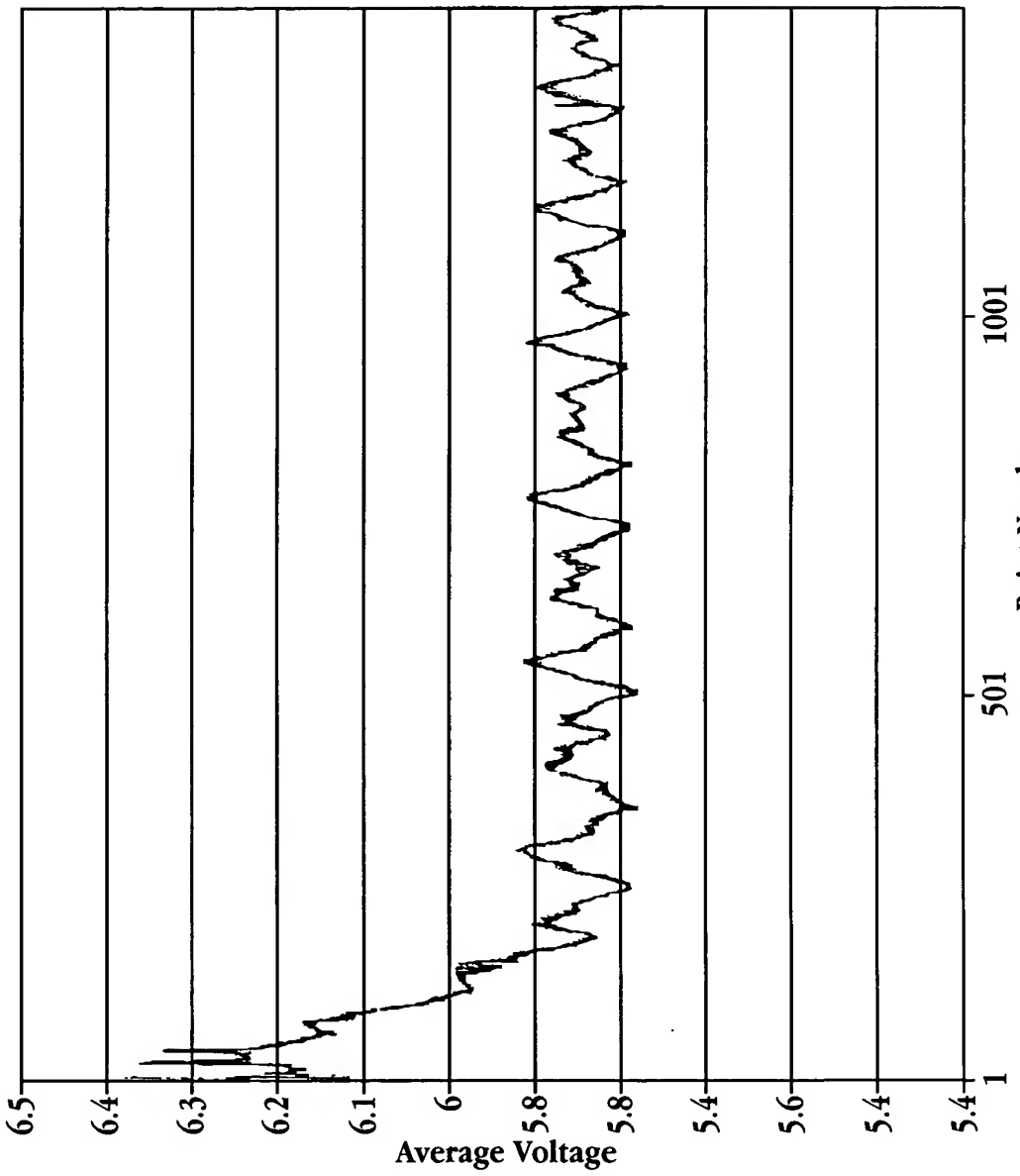
6.5
6.4
6.3
6.2
6.1
6
5.8
5.8
5.4
5.6
5.4
5.4
Average Voltage
1
501
1001
Point Number

Fig. 14B

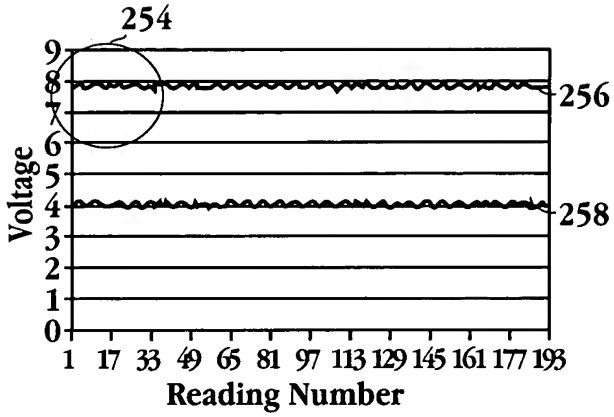

Fig. 15A

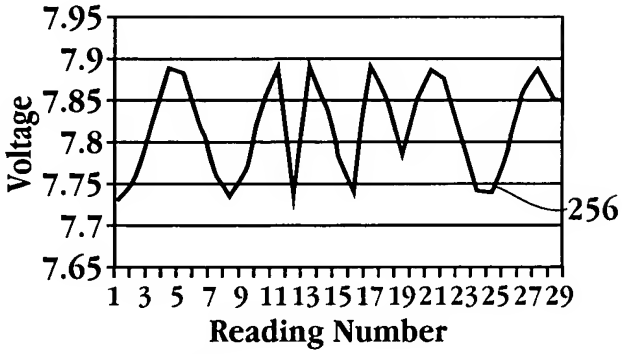

Fig. 15B

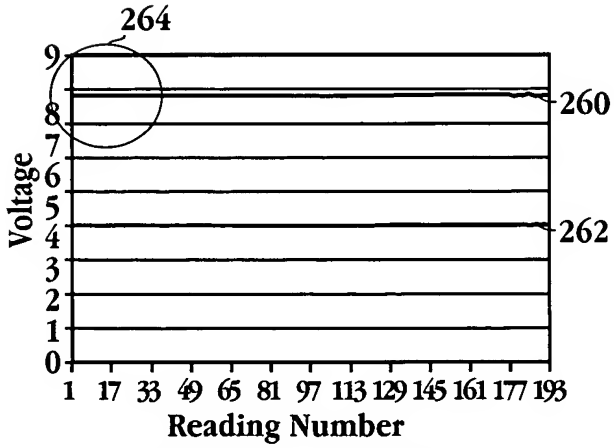

Fig. 16A

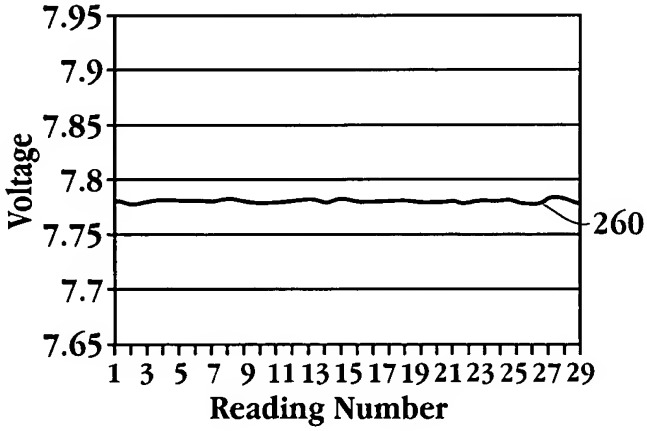

Fig. 16B

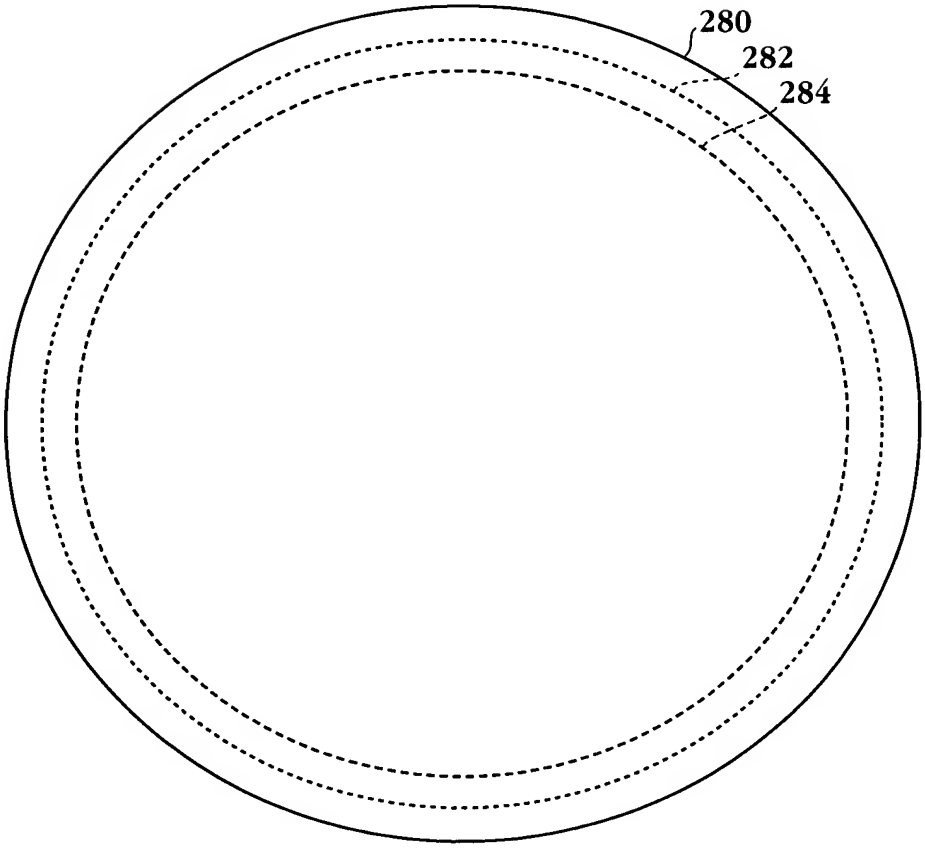

Fig. 17

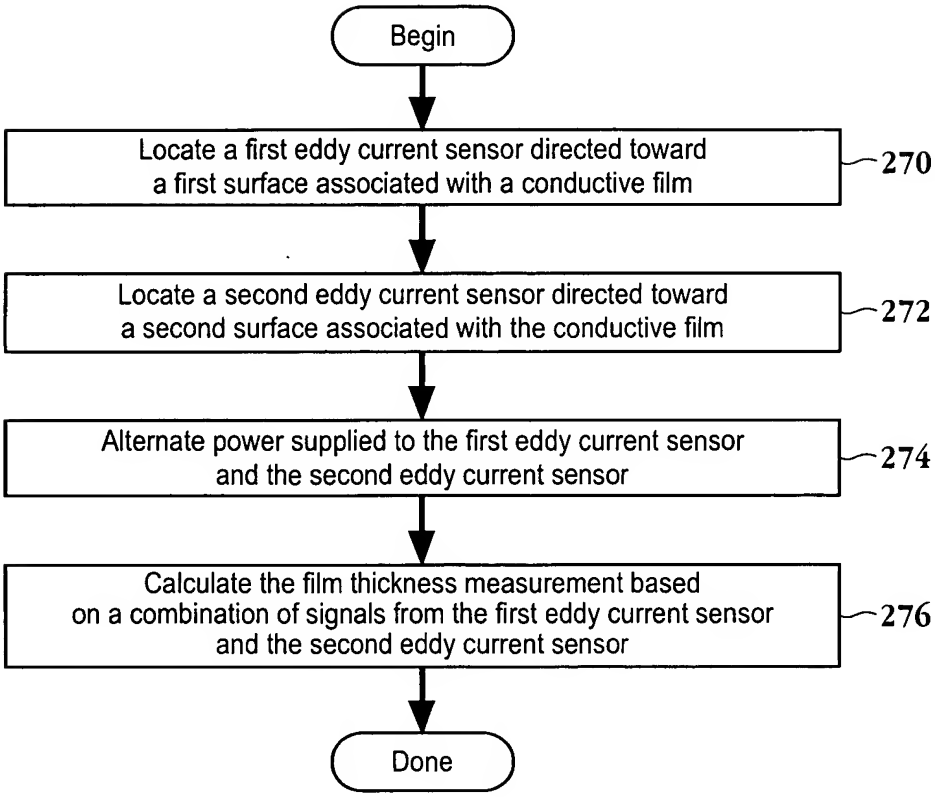
Begin
Locate a first eddy current sensor directed toward a first surface associated with a conductive film
270
Locate a second eddy current sensor directed toward a second surface associated with the conductive film
272
Alternate power supplied to the first eddy current sensor and the second eddy current sensor
274
Calculate the film thickness measurement based on a combination of signals from the first eddy current sensor and the second eddy current sensor
276
Done

Fig. 18